September 1, 2004

TITLE: Proposed Monitoring Program to Determine Extent of WTC Impact

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BACKGROUND: This proposal is the result of a number of meetings and discussions concerning efforts to monitor the situation for workers and residents impacted by the collapse of the World Trade Center. EPA convened an expert review panel to guide and assist the Agency in its use of available exposure and health surveillance databases and registries to characterize any remaining exposures and risks, identify unmet public health needs, and recommend any steps to further minimize the risks associated with the aftermath of the World Trade Center attacks. This panel was conceived during the latter part of 2003, and met for the first time in March of 2004. There have been a total of 5 panel meetings to date, and it is expected that monthly meetings will continue through 2005. The Panel was tasked to interact with EPA on plans to address four major issues that were defined in a letter from the Council on Environmental Quality (CEQ) dated October 27, 2003. These issues are, briefly: recontamination of apartments previously cleaned due to heating, ventilation, and air conditioning systems; use of asbestos as a surrogate for determining the risk from other contaminants; enhancement of the health registry; and characteristics of the WTC plume. Presentations have been made to the panel by EPA, by Panel Members, and by invited speakers on a number of technical topics that pertain to these issues. The meetings have been attended by the public, who have provided input to the panel during comment periods scheduled as part of the agenda for each meeting. A full description of the activities of the panel can be found on the internet at, http://www.epa.gov/wtc/panel/index.html. All pertinent documents and presentations are posted on this site for download.

The first issue identified in the CEQ letter pertained to sampling that was to be conducted by EPA that would address the possibility of residential recontamination. According to the letter, EPA was to report on, "Post cleaning verification sampling to be done by EPA in the residential areas included in EPA's Indoor Air Cleanup to verify that re-contamination has not occurred from central heating and air conditioning systems." EPA proposed a monitoring plan that would test for asbestos in a sample of previously cleaned apartments as a means of determining whether "re-contamination" had occurred. The panel members recommended that testing for "contamination" should be conducted instead, and the proposal reported in this document is the result of panel discussions on this topic, and other deliberations by EPA.

The second issue identified in the CEQ letter pertained to the use of asbestos as a surrogate. The panel was to evaluate, "The peer reviewed 'World Trade Center Indoor Air Assessment and Selection of Contaminants of Concern and Setting Health-Based Benchmarks,' which concluded asbestos was an appropriate surrogate in determining risk for other contaminants." Using a peer review contract, EPA solicited expert comment on the use of asbestos as a surrogate for determining risk from other contaminants, and provided a report on those comments back to the panel. The external reviewers generally supported the use of asbestos as a surrogate, but encouraged the concurrent testing for lead. The panel did not support the position that asbestos was an appropriate surrogate to determine risk for other contaminants, and instead discussions have led to the promotion of a concept that a "World Trade Center" signature exists in dust, and that sampling could focus on determining the presence of that signature as well as levels of contaminants of potential concern. That signature has been identified in numerous outdoor dust samples and efforts are underway to confirm its presence in the indoor environment.

The panel has not, as yet, addressed the third major task of the CEQ letter: “Identification of any areas where the health registry could be enhanced to allow better tracking of post-exposure risks by workers and residents.”

The panel, as part of its deliberations on an appropriate sampling plan, addressed the fourth task identified in the CEQ letter: “Review and synthesize the ongoing work by the federal, state and local governments and private entities to determine the characteristics of the WTC plume and where it was dispersed, including the geographic extent of EPA and other entities' monitoring and testing, and recommend any additional evaluations for consideration by EPA and other public agencies.” Panel members and EPA have made presentations on these issues and have engaged in substantial discussions on alternative approaches. The panel has recommended that EPA do further testing for all contaminants of potential concern (COPCs) (some also recommend Hg be added) in an area that goes beyond Canal Street.

The following proposal replaces the original proposal made by EPA to address the issue of “recontamination”, and instead will addresses “contamination” as well as the geographic extent of WTC impacts. A cornerstone of this proposal is the existence of a World Trade Center signature in sampled dust.

OBJECTIVES: Concurrent efforts have these objectives:

1. To estimate the geographic extent of World Trade Center (WTC) collapse and fire plume residues (contaminants of potential concern (COPCs)) by surveying residential and non-residential buildings in lower Manhattan that volunteer to participate. Interpretation of the results will be contingent on the number and geographic distribution of volunteered buildings. Sub-objectives will be to relate results of the survey to building cleaning history and to the role of central heating, ventilation, and air conditioning (HVAC), if the information collected will support such an analysis.
2. To validate a method to identify a WTC signature in indoor dust.

APPROACH:

<u>I. GEOGRAPHIC EXTENT SURVEY</u>

<u>A. Overview:</u> The primary objective of this sampling program will be to estimate the geographic extent of World Trade Center (WTC) collapse and fire plume residues in a sample of buildings that volunteer to participate. Success in meeting this objective is contingent on developing a "signature" for WTC dust and fire plume residues and the availability of a sufficiently large list of candidate buildings (referred to as the 'sample frame') to provide sufficient coverage of the area to be studied. If sufficient volunteers are not forthcoming it may not be possible to determine the extent of contamination with an adequate degree of confidence. Secondary objectives include ascertaining the relationship between measurements and building cleaning history, and ascertaining the role of HVACs in the potential recirculation of WTC dust. Based on results, a second phase of sampling may then extend into other areas.

The intent is to characterize entire buildings by sampling a number of units within each building selected. The area of sampling extends throughout lower Manhattan to Houston Street, an area roughly double the size of the area included in the initial dust clean up program. The "target population" of buildings includes all "public" buildings and "private" buildings that volunteer to participate. Public buildings are defined as buildings which are occupied by public institutions, such as schools, firehouses, public housing, and buildings housing government offices. Private buildings include apartment buildings and private office/commercial buildings. For purposes of the objectives stated above, these buildings can also be characterized with regard to potential exposures – whether they are residential or non-residential, and non-residential mostly denotes buildings that house commercial or workplace environments. A list of buildings will be compiled including all buildings that volunteer to participate in the survey. Complete participation in this survey is required, meaning that a sufficient number of units within these buildings will be made available for sampling. Only with this level of participation can the survey be characterized as a "building survey" (in contrast to an apartment survey, an office survey, or a different survey with a smaller sampling unit). As discussed below, a procedure to sample numerous "units" within the building will allow for a complete building characterization.

B. Sampling Design: A statistical approach, referred to as spatially balanced sampling, will be used to select a sample of buildings from the list of all eligible buildings. Spatially balanced sampling was developed as a powerful and flexible technique for selecting spatially well distributed probability samples with wide application to sampling of environmental populations. The methodology is described in Stevens, D. L., Jr. and A. R. Olsen (2004). "Spatially-balanced sampling of natural resources." Journal of American Statistical Association 99(465): 262-278. A copy of this paper is available on the internet at http://www.epa.gov/nheerl/arm/documents/grts_asa.pdf The spatially balanced sampling methodology has been applied successfully to the sampling of lakes, rivers and streams and other environmental sampling applications in which selection of a probability sample that provides balanced coverage over a specified geographic area is required.

The buildings to be sampled in Lower Manhattan constitute a finite population of distinct units that occupy fixed locations specified by two-dimensional coordinates. The geographic coordinates for each building are the key to sample selection process. The building coordinates are transformed mathematically to create an ordered spatial address for each building which then becomes the basis for building selection. A hierarchical square grid is then established over the area to be sampled and buildings are located within each grid cell. Selection of buildings within grid cells can then proceed via a spatially balanced random selection procedure to arrive at the final list of buildings to sample.

The sample design can be adjusted to accommodate a variety of sampling objectives and requirements. For example, categories of distance from the WTC site can be used to stratify the population and sampling can be designed to have equal numbers of buildings per category or proportional sampling by category. Different categories of buildings are possible such as building type, cleaning status or HVAC category. If stratifying based on building characteristics other than distance from Ground Zero is possible, than it may be implemented. However, the main objective of the current sampling program is to support estimates of "geographic extent".

In order to implement a spatially balanced sample selection for the lower Manhattan area, the following must be accomplished:

<u>1. Identify the geographic area for sampling:</u> Figure 1 shows the location of key areas where an EPA Environmental Photographic Interpretation Center (EPIC, 2004) analysis determined the extent of deposition of WTC dust and debris. The ground dust/debris boundaries in Figure 1 were derived from the analysis of multiple images taken between September 11 and September 13, 2001. This is the area that EPA believes was most heavily impacted by the dust generated when the towers collapsed. As can be seen in Figure 1, "confirmed dust/debris" areas extend to approximately Chambers Street, "probable dust/debris" areas extend to approximately Canal Street , and "possible dust/debris" areas extend to approximately Spring Street on the West Side near the Holland Tunnel. Figure 2 displays this area in Lower Manhattan on a color-coded map, and based on this analysis and public input, EPA has designated the area beneath Houston St to be included in the sampling. Houston St is shown in Figure 2 as a dashed line.

<u>2. Identify buildings eligible for sampling:</u> Efforts are underway to develop a list of eligible buildings. EPA is working with New York City and others to identify public buildings which will allow EPA access for sampling. Concurrently, the WTC Panel's community liaison workgroup is initiating a community-based participatory research effort which will educate the public on the panel's monitoring and other programs, and help to enlist participation in this building survey. These efforts will result in a list of residential and non-residential buildings which will be eligible to be selected for the survey.

An important qualifier to this list of buildings is that there will be a building self-selection bias built into this survey. A "self-selection bias" is defined as the bias introduced because the survey participants will volunteer, rather than be randomly selected from all possible survey participants. Self-selection could result in a non-representative sampling. It is expected that the efforts to enlist public and private buildings will be successful, and that the list of eligible buildings will include a cross section of building types, and there will be a sufficient geographic spread of buildings.

Once this list is complete, building selection can proceed. Buildings will be stratified by distance from the WTC site in order to assess geographic extent of residues from the collapse of the buildings. There may also be a desire to use a second stratification variable such as building type. For example, there may be a desire to guarantee that buildings of a certain size are included in the sample. If so, then building selection would be based on stratification of the population by distance from the WTC site and by size of the building. This option can be considered once the list of eligible buildings is complete.

3. Construct the spatially balanced sampling frame: A square grid is overlain on the sampling area, and then sample points, or in this case buildings, are located within each square. Squares and then buildings within squares are selected in a statistically based manner, as per Stevens and Olsen (2004). Stratification will be used to make the final building selection, but specific strata cannot be specified further until the final list of eligible buildings is available.

Alternative stratifications of the sample population will be explored in the process of constructing a sample. For example, Figure 2 shows the lower Manhattan area bounded by Houston Street with regard to the EPIC results with confirmed dust/debris areas in red; probable dust/debris areas in orange and possible dust/debris areas in pink. These area designations could be combined with distance categories to create an effective stratification of the population. The distance stratification can be constructed to form what are, in effect, concentric circles around the WTC site while the dust/debris categories would insure that sufficient sample coverage in these areas is obtained. Figure 3 displays a possible outcome of applying this spatially balanced approach using distance categories as suggested. The squares and crosses in the figure are hypothetical buildings situated around Ground Zero at varying distances. The squares are buildings that might comprise the final set of buildings to sample, and the crosses identify other eligible buildings that were not selected. The black square/crosses are the nearest category at 0 – 500 meters from Ground Zero, while the green are the furthest category at 1500 – 3000 meters. It is seen from this figure that good geographic coverage in Lower Manhattan in all directions is achieved. Other possible stratification factors such as building type can also be explored but all of these considerations are highly dependent on the number and location of volunteer buildings.

C. Approach to Building Characterization: In order to gain sufficient coverage of each building, one "unit" for every two floors will be sampled. Therefore, taller buildings will receive more representation in the results in terms of numbers of samples. Adjustments may be required to account for location so that buildings with more data do not misrepresent spatial patterns. A "unit" generally denotes a reasonably small, confined, and well defined area that will be different for each building and building type. For example, a unit within a school could be a classroom, within a residential building could be an apartment, and within an office building could be an area including several cubical and private offices. Priority in unit selection will be given to the units closest to Ground Zero – i.e., the ones most nearly facing Ground Zero and to units served by HVAC systems. Two sets of dust samples will be taken within each unit: 1) locations where dust-related exposures are likely to occur, such as in elevated horizontal surfaces (e.g., desk or table tops) and floors, and 2) locations where WTC dust may have accumulated but not necessarily cleaned, such as behind or on top of cabinets. Wipe samples as well as microvac (using method ASTM D 5755-95) samples will be taken; wipe samples will be taken from non-porous surfaces such as table tops, and microvac samples will be taken on porous surfaces such as rugs or fabric furniture. Enough sample volume will be taken so that contaminant analysis can measure for what are anticipated to be WTC signature contaminants as well as other “contaminants of potential concern” (COPCs; see overview on contaminants sampled below).

In addition to dust samples, three or more air samples will be taken in each exposure unit, depending on the configuration of the exposure unit, so that the data can be interpreted with a prescribed level of confidence. A “modified aggressive” air sampling approach will be used. A “modified aggressive” air sample is one in which a fan is employed to cause agitation of dust. Other sampling approaches considered and rejected include passive air sampling and aggressive air sampling. Concern was expressed that passive as well as aggressive air sampling may not appropriately mirror activities that could suspend dust and cause exposure, such as child’s play. Also, aggressive air sampling, which involved use of a leaf blower in addition to the floor fans, was felt to be too disruptive, thus potentially severely limiting participation in the survey; and unrepresentative of long term exposure. The purpose of these air samples is twofold: 1) to describe the relationship, if any, between results in dust samples and air samples, and 2) to facilitate health-impact analysis by comparing results from the air samples to inhalation-based health benchmarks. Settled dust samples will also be compared to appropriate health-related benchmarks for contaminants (e.g., PAHs) exhibiting toxicity from exposure through incidental ingestion and dermal contact with contaminated surfaces, although this comparison to results from dust samples taken in inaccessible areas will be caveated since health-related benchmarks are based on exposures that will not occur in these inaccessible areas. All results of sampling will be shared with the building or apartment owners. If results indicate exceedence of benchmarks, recommendations for cleaning will be made to the owners. An offer to clean the exposure unit at no cost to the owner will also be made. Procedures used in the indoor dust clean up program will be followed for cleaning residences. Procedures for cleaning will have to be worked out to minimize disruption of commercial enterprises.

D. Contaminants of Potential Concern, COPCs: COPCs will be measured in both the air and dust samples. They are shown below with their risk-based benchmarks:

COPC	Indoor Air Benchmark	Settled Dust Benchmark
Asbestos	0.0009 S/cc	TBD*
MMVF	0.01 S/cc	NA**
PAH	0.2 $\mu g/m^3$	150 $\mu g/m^2$
Silica	5 $\mu g/m^3$	NA***

*To be determined. Because Asbestos is primarily an inhalation toxin, a risk-based benchmark for settled dust needs to be well-correlated to an indoor air concentration. The relationship between asbestos in settled dust and indoor is influenced by many factors (e.g., activity patterns, surface texture, room volume, air-exchange rates) and is, consequently, highly variable. Thus, the development of a risk-based benchmark for asbestos in settled dust would have a high uncertainty factor. In the absence of indoor air sampling data, an asbestos fiber count of 5,000 f/cm^2 has been employed in Libby, Montana to trigger clean-up of homes. This value was guided by information on background levels of asbestos in indoor settled dust.

** Not applicable. Although it is also a contact irritant, _MMVF, like asbestos, is mainly an inhalation toxin. Therefore, a risk-based benchmark for settled dust needs to be well-correlated to an indoor air concentration. The uncertainties attendant in predicting an asbestos air concentration based on settled dust measurements apply equally to MMFV. In addition, there is a paucity of studies in the scientific literature directed at characterizing background loads (fibers per unit area) of MMVF in settled dust the indoor environment. Consequently, a benchmark for MMFV in settled dust, risk-based or otherwise, is not proposed

*** Not applicable. Neither the peer review draft nor the final version of the COPC report proposed a health-based benchmark for silica in settled dust. Like asbestos and MMVF silica is primarily an inhalation toxin. The benchmark for silica in indoor air is based on detection limits, therefore, a health-based benchmark for silica in settled dust is not applicable

The indoor air and settled dust benchmark for the COPCs were developed as part of the Region 2 Clean-Up Program. They were developed using a risk assessment approach, and were peer-reviewed.

It is important to note that lead and dioxin have been identified as WTC COPCs, but these are not on the list. Lead, which can cause serious learning disabilities and behavioral problems in children, is commonly found in the air, water, soil and indoor dust of the urban environment, and in people's diets. It is often present in older housing that may contain lead-based paint. According to HUD data, about five percent of the housing stock in the Northeast has lead levels above the 25 $\mu g/ft^2$ benchmark. In buildings constructed before 1939, more than 10 percent exceed 25 $\mu g/ft^2$. This factor makes it difficult to distinguish between lead from World Trade Center dust and other sources, especially in older buildings. However, if specific requests are made to analyze samples for lead, such an analysis will be conducted. All findings will be reported to owners along with options for actions to be taken based on the findings. It is recommended that dioxin also not be measured in this survey. Like lead, dioxin is a ubiquitous urban contaminant, so attributing dioxin findings to WTC is difficult. Second, dioxin dust sampling during EPA's Clean-Up Program in 2002 found very little dioxin in apartments in the Clean-Up Zone. Of 538 dust samples taken in 262 apartments, only 8 samples, or 0.5%, showed a level greater than the dust standard developed by Region 2 of 2 ng/m^2, and also, levels found were not significantly different from levels in the background study. The single high outlier of 75 ng/m^2 was found on a mantel over a fireplace, and given that dioxins are a product of incomplete combustion, to find this elevated level above a fireplace is not unexpected.

The WTC signature concurrent effort (discussed below) is currently targeting MMVF and PAHs as possible signature compounds to identify WTC dust and WTC fire by-products, respectively. Analysis of the samples for the above-mentioned COPCs will likely proceed before the WTC signature workgroup is able to complete their validation study. Before any samples are taken, however, the workgroup will provide information on the necessary sample volume and analytical methods which will allow for the measurement of the dust and air samples for the signature compounds with an appropriate level of detection.

E. Analytical Methods and Sampling Protocols: These are shown in Tables 1. These are the methods and protocols that were used in EPA's background and confirmation cleaning study.

<u>F. Heating, Ventilation, and Air Conditioning (HVAC) Sampling:</u> In order to characterize central HVAC units in buildings which have full or partial central HVAC units ("full" defined as units serving both common areas and individual apartments, offices, etc; while "partial" is defined as units serving only common areas while apartments or offices have individual units), samples will be taken in: 1) outdoor air inlet to HVAC, 2) air mixing plenums serving sampled floors, and 3) HVAC outlet discharging to locations where COPC samples are taken. Additionally, HVAC filters will be sampled. While all samples may be informative with regard to WTC impact, it is expected that the last noted sample location, where the HVAC discharges to where COPC samples are taken, may be the most informative with regard to elucidating the role HVAC systems have on recirculating WTC contaminants to exposure areas.

<u>G. Data Analysis:</u> The data collected will be used to estimate the number, proportion, and location of buildings: 1) where measurements of COPCs exceed benchmarks; and 2) where measurements indicate the presence of WTC signature dust. Based on the results of this sampling, EPA may offer to clean the area in the building where sampling occurred, or in certain circumstances, may offer to clean an area larger than just the sampled area. Prior to completion of the WTC signature validation study, the decision criteria for follow-up cleaning is based on the COPC findings: if either an air or a dust benchmark for any COPC is exceeded, EPA will offer a cleaning. The exception to this is if a measurement for lead is requested and the appropriate benchmark is exceeded. As noted above, in this case, the owner and resident of the area sampled will be advised of his options. If a signature validation study can be completed before or while sampling is occurring, than the decision criteria for clean-up may be different than stated above. For example, the presence of this signature in sampled dust or air, with or without exceedence of a COPC, may also warrant an offer for a clean-up. Decision criteria on when a clean-up is offered due to presence or absence of a WTC signature cannot be elaborated upon at this time. Criteria will be contingent upon the success of the validation effort, and also the "strength" of the signature must be considered in evaluating the results. Results will be categorized according to location such as by district 1, 2 and 3 and distance of sampling node from the WTC site.

II. WTC SIGNATURE VALIDATION STUDY

<u>A. Overview:</u> The WTC attacks on 9/11 caused the airborne release of two types of dusts: those related to the building collapse and fine particulate matter from the subsequent fires. The goal of this study is to collect dust samples from areas near the WTC and distant from the WTC (background NYC dusts). These dust samples will be used to validate chemical markers or signatures for WTC dust - as compared to background dust - for the larger sampling effort described above to determine the geographic extent of WTC dust residues and COPCs. To the extent they may be available, archived samples will also be retrieved and analyzed to better understand the characteristics of WTC dust near the time of the disaster. The markers or signatures for WTC dust are being developed by laboratories at EPA, USGS, and several universities. By sampling a number of contaminated and uncontaminated sites today, and by utilizing archived samples, the WTC signatures can be validated or improved for the larger sampling study, and any possible changes in the WTC signature over time can also be studied.

B. Approach: EPA has a contract in place to assist in this sampling effort. EPA will identify contaminated and uncontaminated buildings in NYC and obtain access for the contractor to conduct the sampling. To the extent possible, contaminated buildings that are within both the dust and the fire plumes will be selected, so that current dust samples for these two types of emissions can be collected. EPA may identify several groups of buildings over time, as permission for access is obtained. EPA will provide to the contractor the street address and the name and phone number for a contact person in each building identified for surveying. The contractor will conduct scoping surveys of buildings (i.e., photos, age of building, construction details, HVAC details, etc.) identified by the EPA. When all approvals and other pre-sampling activities are complete, the contractor will then undertake the sampling program which entails these tasks: prepare sampling plans, collect samples, split the samples for multiple laboratories, ship the samples as directed, archive samples for up to two years for future analysis, and prepare reports on their activities. Quality assurance documentation including the implementation of chain of custody procedures shall be required for this activity. The laboratories who will receive the samples and conduct the analysis have not, as yet, been determined.

References

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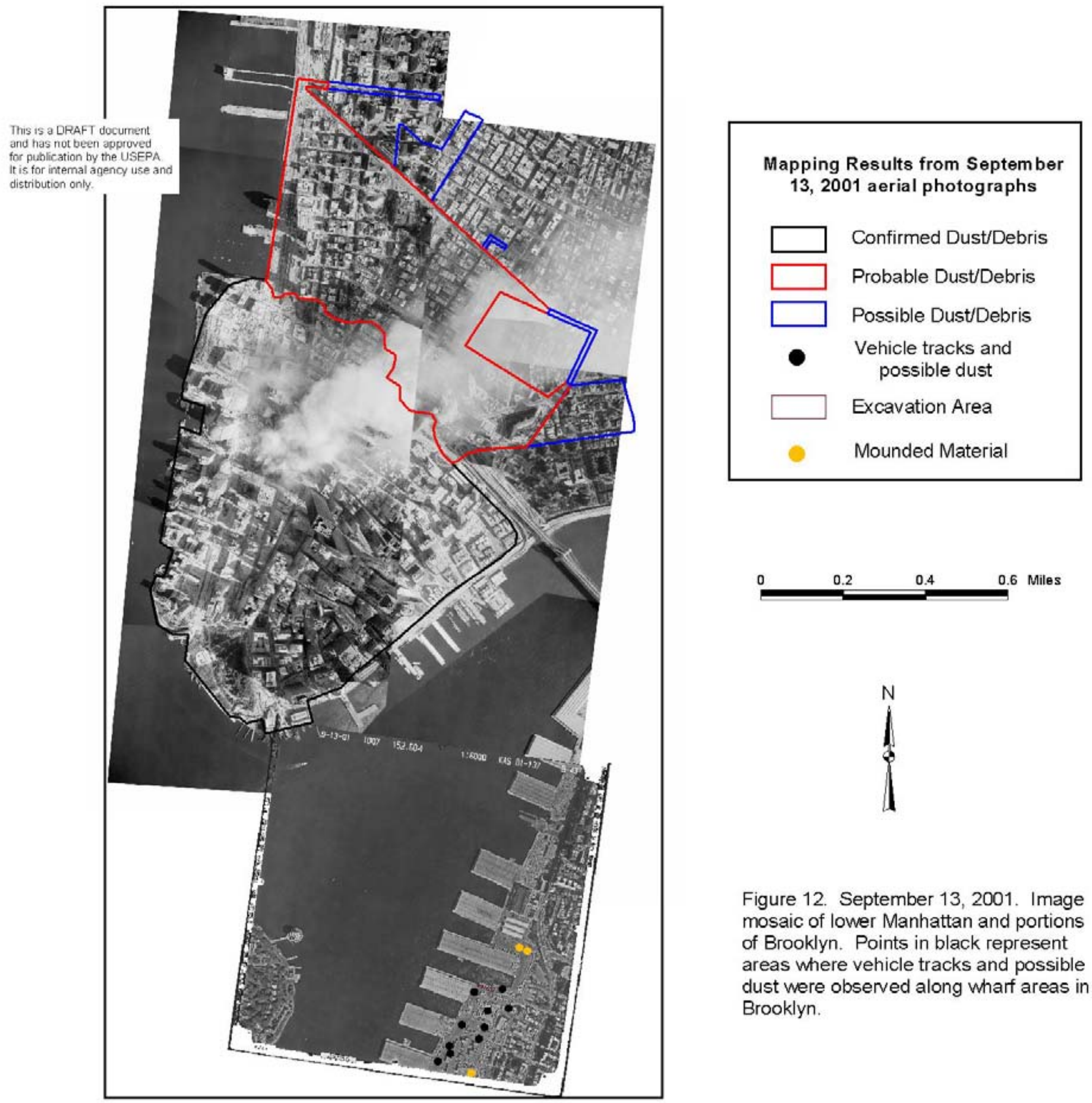


Figure 1. Display of boundaries of expected deposition based on analysis conducted by EPA's Environmental Photographic Interpretation Center (EPIC, 2004).

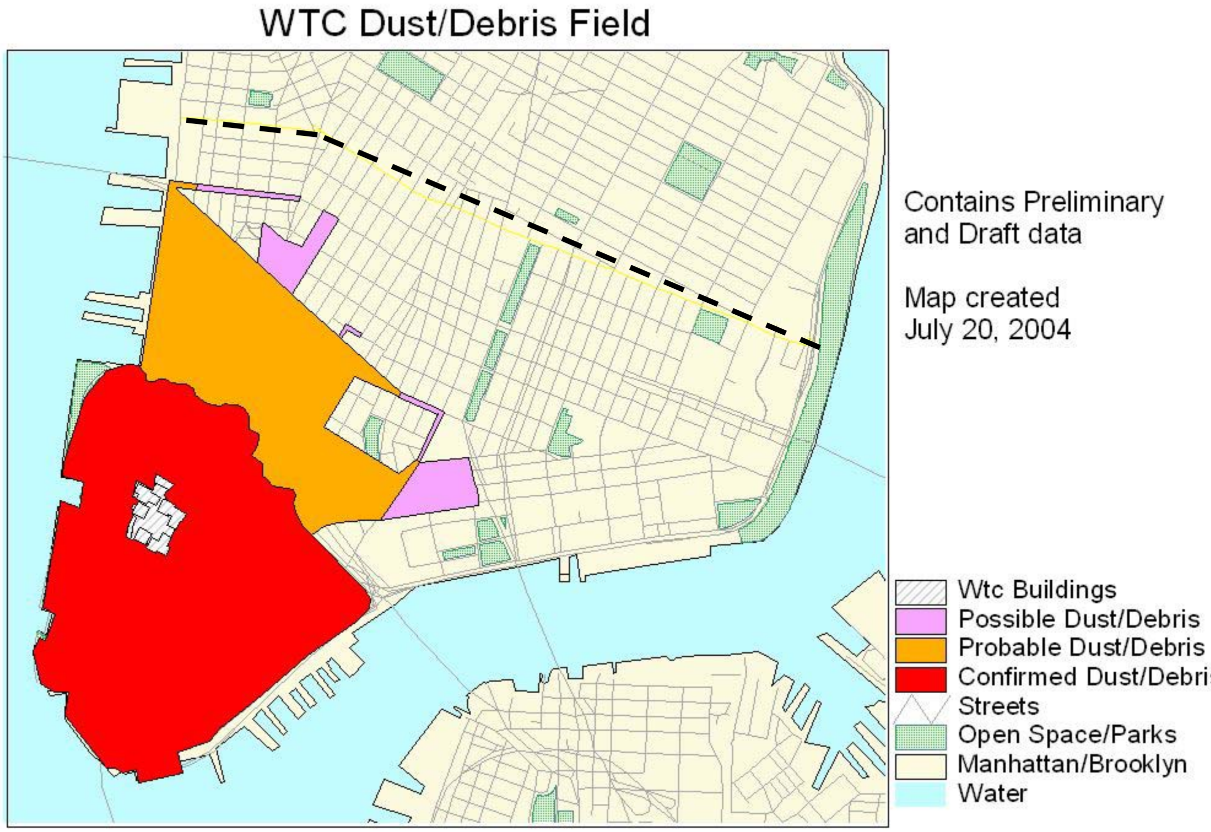
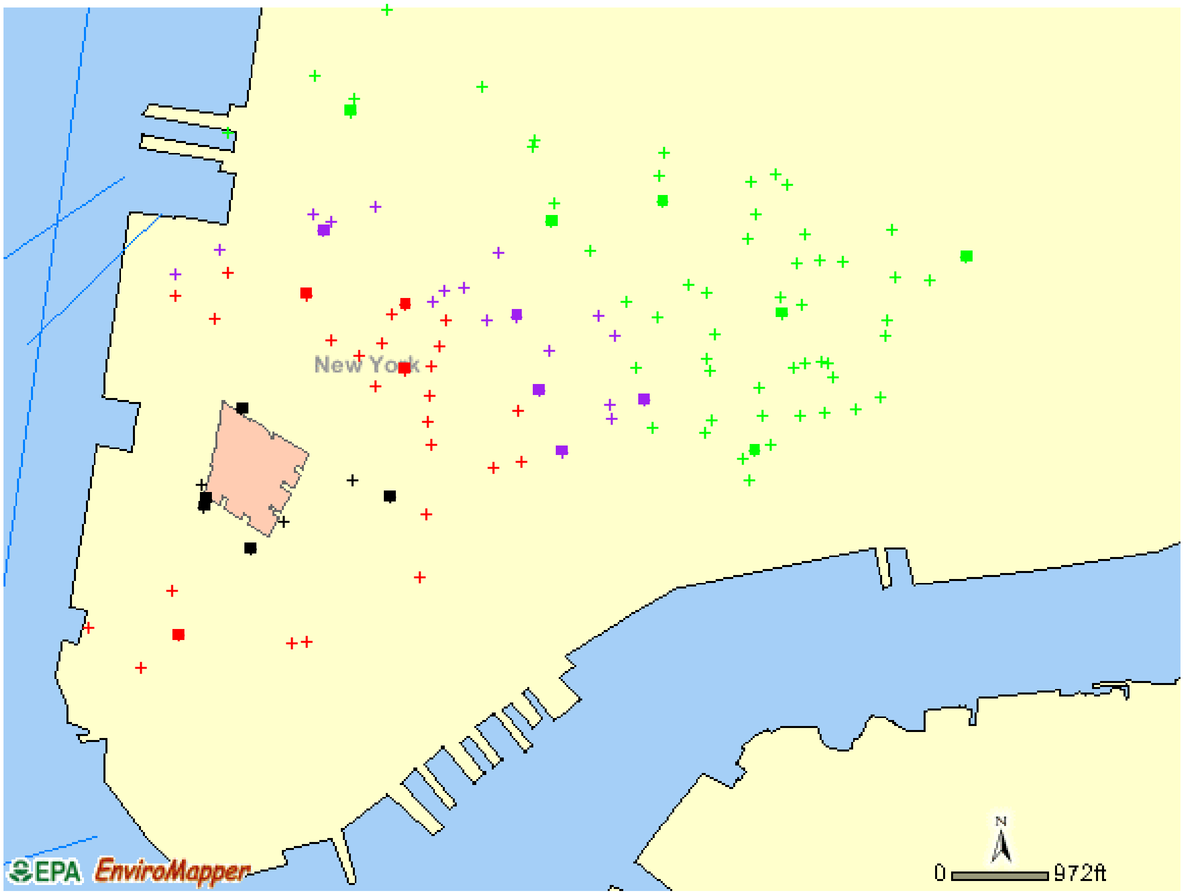


Figure 2. The study area of Lower Manhattan bounded by Houston St, shown in dashed lines, overlain on the EPIC results which are displayed in three colors: red meaning confirmed dust/debris; orange meaning probably dust/debris, and pink meaning possible dust/debris.



Key: squares: buildings actually selected; crosses – buildings that are eligible to be selected. Black – buildings within 0- 500 meters of Ground Zero; Red – buildings 500 – 1000 meters; Purple – buildings 1000 – 1500 meters. Green – buildings 1500 – 3000 meters.

Figure 3. Example of possible outcome of a spatially balanced approach to building selection (see text for a further description of this map).

Table 1. Proposed Sampling and Analytical Methods for the Building Sampling Program.

Media	Sampling Points	Analytical Parameters	Sampling Method Proposed	Description	Analytical Method Proposed	Proposed Reporting Limits
Settled Dust Porous Soft Surfaces	Carpets, fabric furniture or drapery in areas of activity (living rooms, class rooms, offices, etc.)and accumulation (behind or on top of cabinets/bookcases).	Asbestos	ASTM D 5755-95	Micro vacuuming method.	ASTM D 5755-95	1000 structures/cc
		Lead	ASTM E 1973-99	Micro vacuuming method.	SW-846 6010B	2 ug/ft2
		Silica	HUD Appendix 13.1**	Micro vacuuming method.	NIOSH 7500 (XRD)	1000 ug/ft2
		MMVF	ASTM D 5755-95	Micro vacuuming method.	EMSL MSD.0300 or Equivalent	1000 f/cm2
Settled Dust Non-porous Hard Surfaces	Horizontal surfaces of tables or counters and bare floors, ceilings and walls in areas of activity (living rooms, class rooms, offices, etc.) and accumulation (behind or on top of cabinets/bookcases).	Asbestos	ASTM D 6480-99	Wipe Samples.	ASTM D 6480-99 (wipe)	1000 structures/cc
		Lead	HUD Appendix 13.1	Wipe Samples.	SW-846 6010B	2 ug/ft2
		PAHs	ASTM D 6661-01	Wipe Samples.	ASTM 6661-01/SW-846 8270C	0.150 mg/m2
		Silica	HUD Appendix 13.1**	Wipe Samples.	NIOSH 7500 (XRD)	1000 ug/ft2
		MMVF	ASTM D 6480-99	Wipe Samples.	EMSL MSD.0300 or Equivalent	1000 f/cm2
Indoor Air	Areas of known activity (living rooms, class rooms, offices, etc.)	Asbestos	NIOSH 7400	Air Samples.	PCM NIOSH 7400 followed by TEM AHERA method.	PCM 0.0009 f/cc ; TEM 0.0004 f/cc
		Lead	NIOSH 7300	Air Samples.	SW-846 6010B	0.1 ug/m3
		PAHs	NIOSH 5515	Air Samples.	SW-846 8270C	0.2 ug/m3
		Silica	NIOSH 7500	Air Samples.	NIOSH 7500 (XRD)	0.5 ug/m3
		MMVF	NIOSH 7400	Air Samples.	EMSL MSD.0300 or Equivalent	<0.01 f/cc

Table 1 (cont'd).

Media	Sampling Points	Analytical Parameters	Sampling Method Proposed	Description	Analytical Method Proposed	Proposed Reporting Limits
HVAC Filters	HVAC, AC, or HEPA unit filters (collection of bulk dust sample from air filters and mixing plenums).	Asbestos	Bulk Sample	Bulk Samples.	PLM NYS 198.1 followed by TEM NYS 198.4	1000 structures/cc
		Lead	Bulk Sample	Bulk Samples.	SW-846 6010B	2 ug/ft2
		PAHs	Bulk Sample	Bulk Samples.	SW-846 8270	<0.3 mg/m2
		Silica	Bulk Sample	Bulk Samples.	NIOSH 7500 (XRD)	1000 ug/ft2
		MMVF	Bulk Sample	Bulk Samples.	PLM NYS 198.1/EMSL MSD.0300 or Equivalent	1000 f/cm2
HVAC Systems	HVAC Systems -Inlet and outlet	Asbestos	ASTM D 6480-99	Wipe Samples.	ASTM D 6480-99 (wipe)	1000 structures/cc
		Lead	HUD Appendix 13.1	Wipe Samples.	SW-846 6010B	.2 ug/ft2
		PAHs	ASTM D 6661-01	Wipe Samples.	ASTM 6661-01/SW-846 8270C	0.150 mg/m2
		Silica	HUD Appendix 13.1**	Wipe Samples.	NIOSH 7500 (XRD)	1000 ug/ft2
		MMVF	ASTM D 6480-99	Wipe Samples.	EMSL MSD.0300 or Equivalent	1000 f/cm2